

The Shrimps (Penaeoidea, Stenopodidea, Caridea and Astacidea) and Lobsters (Palinura) of Cheju Island, Korea (Crustacea: Decapoda)

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적 요

1987년 9월 30일부터 1988년 3월 26일까지의 조사기간과 조사기간 이전에 제주도의 10개 지소에서 채집된 표본들을 동정하고 문헌상의 기록들을 종합하여 제주도 새우류의 분류목록을 작성하였다. 이 분류목록에는 12과 26종(또는 아종)이 포함되어 있다. 이 중에서 *Palaemon* (*Palaemon*) *gravieri*와 *Pandalus danae*는 제주도에서 처음 기록되는 종들이다. 제주도의 새우류 26종은 한국기 지종 83종(또는 아종)의 31%에 해당되며 26종 중에서 6종(4%)은 제주도에서만 기록되었다. 2종의 담수종을 제외한 24종의 해양종 중에서 9종(37.5%)이 남방형이었다.

Key words: shrimps and lobsters, Decapoda, Crustacea, checklist, Cheju Island, Korea

INTRODUCTION

On the systematic study of Korean shrimps and lobsters, Kim (1977) published the monograph on the all the species reported up to that time. In his monograph, Kim described 80 species of shrimps and lobsters in 16 families and gave a full historic review of the previous studies to his monograph.

본 연구는 1987년도 문교부 학술연구조성비에 의해 “한국산 동·식물의 종속지적 연구(IV)”라는 제목하에 연구된 것의 일부임.

Since then, *Synalpheus tumidomanus* (Paulson) was reported as new to Korean fauna by Kim *et al.* (1979) and *Periclimenaeus gorgonidarum* (Balss) was reported by Kim and Kim (1985) as newly known species from Korea. Out of 22 species of shrimps and lobsters which were reported by Kim (1985), *Pandalus danae* Stimpson was unrecorded one from Korea. Besides those publications mentioned above, Kim, Lee and Kim (1979), Kim and Kwon (1983) and Kim and Chang (1987) reported the fauna of shrimps and lobsters in their local survey reports.

As a result of the previous researches, 83 species (or subspecies) of shrimps and lobsters in 16 families were known in Korea, of which 24 species in 11 families were reported from Cheju Island waters. The synthetic researches of brachyuran crabs (Kim and Chang, 1985) and anomuran crabs (Kim and Kim, 1987) of Cheju Island were already accomplished. But, there was no synthetic research of shrimps and lobsters of Cheju Island. Thus, in the present report the authors intended to grasp overall fauna of shrimps and lobsters of Cheju Island based upon the present new materials and the literature records for the better understanding of the fauna of shrimps and lobsters from Korea and their geographical distribution.

MATERIALS AND METHODS

The present new materials consist of the specimens obtained during the period of survey from September 30, 1987 to March 26, 1988 from the three localities in Cheju Island and the previous specimens collected before this survey and not reported (Fig. 1). Moreover, the authors included literature records made before the present report.

The collections were carried out in intertidal habitats. In addition considerable shrimps and lobsters inhabiting in shallow waters were also collected in fish traps or nets. The materials were preserved in 95% alcohol. All specimens were examined with stereomicroscope. The authors followed Bowman

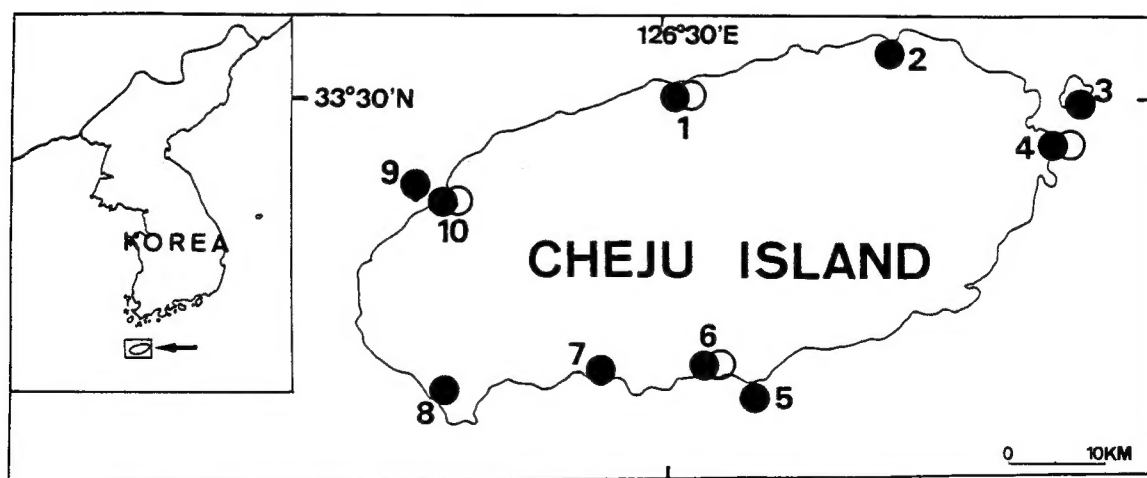


Fig. 1. The map showing localities in Cheju Island where previous and present materials were collected. 1, Cheju(濟州); 2, Kŭmnyŏng(金寧); 3, Udo(牛島); 4, Sŏngsanp'o(城山浦); 5, Supsŏm(金섬); 6, Sŏgwip'o(西歸浦); 7, Taep'o(大浦); 8, Mosŭlp'o(慕瑟浦); 9, Piyangdo(飛揚島); 10, Hallim(翰林). (●: present report; ○: literature record)

and Abele (1982) for the classification of taxa above the family level.

All specimens reported are deposited in the Department of Zoology, Seoul National University.

SYSTEMATIC LIST

The following systematic list of the fauna includes all the species of shrimps and lobsters which appeared in literature records and newly examined in the present report. In this systematic list, the species marked with an asterisk(*) are found only in the Cheju Island, and the ones with double asterisks(**) are unrecorded by this time in Cheju Island. Under each species' name, the localities are cited from literature records and then also is given the material examined when specimens were observed.

Superclass Crustacea Pennant, 1777 갑각 상강
Class Malacostraca Latreille, 1806 연갑 강
Subclass Eumalacostraca Grobben, 1892 진연갑 아강
Superorder Eucarida Calman, 1904 진하 상목
Order Decapoda Latreille, 1803 십각 목
Suborder Dendrobranchiata Bate, 1888 근새 아목
Superfamily Penaeoidea Rafinesque, 1815 보리새우 상과
Family Penaeidae Rafinesque, 1815 보리새우 과

1. *Solenocera prominentis* Kubo, 1949 대롱수염새우
South of Cheju Island (Kim and Park, 1972; Kim, 1977)
Material examined: Hallim, 2♂♂, 4♀♀, May 2, 1985; Sŏgwip'o, 1♀, Apr. 22, 1987; Cheju, 4♂♂, 4♀♀, Mar. 26, 1988.
 2. *Penaeus (Melicertus) japonicus* Bate, 1888 보리새우
Cheju (Kim, 1985)
 3. *Trachypenaeus curvirostris* (Stimpson, 1860) 꽃새우
Near Cheju Island (Kim, 1976a; Kim, 1977)
Material examined: Hallim, 4♀♀, May 2, 1985; Cheju, 7♀♀, Mar. 26, 1988.
 4. *Parapenaeus fissuroides* Crosnier, 1985 민 꽃새우
South of Cheju Island (Kim and Park, 1972; Kim, 1977)
 5. *Metapenaeopsis dalei* (Rathbun, 1902) 산모양깔깔새우
Near Cheju Island (Kim, 1976a; Kim, 1977)
- Suborder Pleocyemata Burkenroad, 1963 포란 아목
Infraorder Stenopodidea Claus, 1872 해로새우 하목
Family Stenopodidae Claus, 1872 해로새우 과
6. **Spongicola venusta* De Haan, 1844 해로새우
Sŏgwip'o (Kim and Park, 1972; Kim, 1977)

Infraorder Caridea Dana, 1852 생이 하목
 Superfamily Atyoidea De Haan, 1849 새뱅이 상과
 Family Atyidae De Haan, 1849 새뱅이 과

7. *Paratya compressa* (De Haan, 1844) 생이
 Do-geun Stream in Cheju (Kim and Park, 1973; Kim, 1977)

8. **Caridina denticulata keunbaei* Kim, 1976 제주새뱅이
 Sögwip'o (Kim and Park, 1973; Kim, 1976a, b; Kim, 1977)

Superfamily Rhynchocinetidea Ortmann, 1890 꼬덕새우 상과
 Family Rhynchocinetidae Ortmann, 1890 꼬덕새우 과

9. *Rhynchocinetes uritai* Kubo, 1942 꼬덕새우
 Cheju (Kim and Park, 1972; Kim, 1977)

Material examined: Sögwip'o, 46 individuals, Jan. 19, 1985; Cheju, 11 individuals, May 1, 1985; Supsörm, 42 individuals, Feb. 14, 1987; Sögwip'o, 46 individuals (28 ovig.), Mar. 24, 1988.

Superfamily Palaemonoidea Rafinesque, 1815 징거리새우 상과
 Family Palaemonidae Rafinesque, 1815 징거리새우 과

10. *Palaemon (Palaemon) serrifer* (Stimpson, 1860) 줄새우아재비
 Hallim (Kim, 1976a; Kim, 1977); Sögwip'o (Kim, 1976a; Kim, 1977); Cheju (Kim, 1976a; Kim, 1977)
 Material examined: Taep'o, 11 individuals, Jan. 15, 1985; Hallim, 9 individuals, May 1, 1985; Piyangdo, 5 individuals, May 2, 1985; Taep'o, 13 individuals, May 13, 1985; Sögwip'o, 5 individuals, Apr. 22, 1987.

11. **Palaemon (Palaemon) pacificus* (Stimpson, 1860) 태평줄새우
 Sögwip'o (Kim, 1976a; Kim, 1977)

12. ***Palaemon (Palaemon) gravieri* (Yu, 1930) 그라비새우
 Material examined: Hallim, 1♂, May 2, 1985.
 Remark: This species was previously recorded in Yellow Sea and South Sea in Korean waters (Kim, 1977).

13. *Palaemon (Palaemon) ortmanni* (Rathbun, 1902) 긴발줄새우
 Cheju (Kim and Park, 1973; Kim, 1976a; Kim, 1977)
 Material examined: Cheju, 2♀♀, May 1, 1985.

14. *Macrobrachium formosense* Bate, 1868 긴발징거리새우
 Sögwip'o [Mori, 1916 (cited from Kamita, 1961); Kim, 1977]

Superfamily Alpheoidea Rafinesque, 1815 딱총새우 상과
 Family Alpheidae Rafinesque, 1815 딱총새우 과

15. *Betaeus granulimanus* Yokoya, 1927 움발딱총새우
 Söngsanp'o (Kim, 1976a; Kim, 1977); Cheju (Kim, 1976a; Kim, 1977)
 Material examined: Mosölp'o, 15 individuals, Jan. 18, 1985.

16. *Alpheus bisincisus* De Haan, 1844 흠발딱총새우

Cheju (Kim, 1976a; Kim, 1977)

Material examined: Söngsanp'o, 2 individuals, Feb. 12, 1987.

Family Hippolytidae Dana, 1852 꼬마새우 과

17. *Heptacarpus futilirostris* (Bate, 1888) 절좁은뿔꼬마새우

Cheju (Kim and Park, 1972; Kim, 1977)

Material examined: Mosülp'o, 1♂, 2♀♀, Jan. 18, 1985; Piyangdo, 30 individuals, Feb. 9, 1987; Udo, 3♀♀, Feb. 12, 1987; Söngsanp'o, 41 individuals, Feb. 12, 1987; Kümnyöng, 1♀, Apr. 24, 1987; Cheju, 1♂, Mar. 26, 1988; Cheju, 1♂, May 1, 1985; Piyangdo, 7♀♀ (ovig.), May 2, 1985.

Superfamily Pandalioidea Haworth, 1825 도화새우 상과

Family Pandalidae Haworth, 1825 도화새우 과

18. *Pandalus danae* Stimpson, 1857 좁은비늘도화새우**Material examined:** Cheju, 2♂♂, 1♀ (ovig.), May 1, 1985.**Remarks:** This species was previously recorded in the Straits of Korea (Mip'o) and Yellow Sea (Gomso) in Korean waters (Kim, 1985).

Superfamily Crangonoidea Haworth, 1825 자주새우 상과

Family Crangonidae Haworth, 1825 자주새우 과

19. **Crangon (Neocrangon) sagamiensis* Balss, 1913 들창뿔자주새우

East of Cheju Island (Yokoya, 1933; Kim, 1977)

Infraorder Astacidea Latreille, 1803 가재 하목

Superfamily Nephropoidea Dana, 1852 가시발새우 상과

Family Nephropidae Dana, 1852 가시발새우 과

20. *Nephrops thomsoni* Bate, 1888 가시발새우

South of Cheju Island (Kim and Park, 1972; Kim, 1977); Cheju (Kim, 1985)

Material examined: Sögwip'o, 3♂♂, 2♀♀, Jan. 19, 1985; Hallim, 2♂♂, 2♀♀, May 2, 1985; Cheju, 3♂♂, Aug. 13, 1985; Sögwip'o, 2♀♀, Apr. 22, 1987; Sögwip'o, 3♂♂, 5♀♀ (ovig.), Mar. 24, 1988.

Infraorder Palinura Latreille, 1903 닭새우 하목

Superfamily Palinuroidea Latreille, 1803 닭새우 상과

Family Palinuridae Latreille, 1803 닭새우 과

21. *Panulirus japonicus* (Von Siebold, 1824) 닭새우

Cheju Island (Kim, 1977)

22. **Linuparus trigonus* (Von Siebold, 1824) 펄닭새우

Cheju Island (Kim and Park, 1972; Kim, 1977)

Material examined: Sögwip'o, 1♀, Apr. 22, 1987; Hallim, 3♂♂, Mar. 26, 1988.

Family Scyllaridae 매미새우 과

23. *Ibacus ciliatus* (Von Siebold, 1824) 부채새우

Hallim (Harada and Holthuis, 1965; Kim, 1977)

Material examined: Sögwip'o, 2♀♀, Jan. 19, 1985; Sögwip'o, 1♀, Mar. 24, 1988; Cheju, 2♂♂, 1♀, Mar. 26, 1988.

24. *Ibacus novemdentatus* Gibbes, 1850 아홉니부채새우

Sögwip'o (Kim and Park, 1972; Kim, 1977); Near Cheju Island (Kim, 1976a; Kim, 1977); Hallim (Kim, 1976a; Kim, 1977)

Material examined: Sögwip'o, 1♂, 1♀, Mar. 24, 1988; Piyangdo, 1♀, May 3, 1988.

25. *Scyllarus kitanoviriosus* Harada, 1962 꼬마매미새우

Sögwip'o (Kim and Park, 1973; Kim, 1977)

Material examined: Cheju, 1♀, May 1, 1985; Sögwip'o, 1 individual, Jan. 19, 1985; Sögwip'o, 2♂♂, 5♀♀ (3 ovig.), Apr. 23, 1987.

26. **Scyllarides haanii* (De Haan, 1841) 매미새우

Sögwip'o (Kim and Park, 1972; Kim, 1977)

DISCUSSION

Fifteen species of shrimps and lobsters in 9 families were identified from 10 localities in Cheju Island. *Palaemon (Palaemon) gravieri* and *Pandalus danae* are unrecorded species by this time in Cheju Island.

The total number of species of shrimps and lobsters which include the literature records and the present materials in Cheju Island are 26 species in 12 families. 26 species (or subspecies) occupy 31% of 83 species (or subspecies) that found in Korea up to now. This is low percentage in comparison with brachyurans (56.8%) (Kim and Chang, 1985) and anomurans (58.6%) (Kim and Kim, 1987). 6 species (4%) of 26 species are only reported in Cheju Island, and 9 species (37.5%) of 24 marine species (excluding 2 freshwater-brackishwater species) are southern form. In addition to 9 southern form, 15 species (62.5%) are temperate form and there is no northern form. Therefore, Cheju Island comprise the largest number of southern form of species of shrimps and lobsters in four regions (Japan Sea, Korea Strait, Yellow Sea and Cheju Island waters) of Korean waters. This fact is in accord with the environmental factor that Cheju Island waters are the most strongly influenced by Tsushima Warm Current and accordingly its water temperature is the highest in the Korean waters (Kim, 1986).

ABSTRACT

The authors prepared a checklist of the shrimps and lobsters of Cheju Island based upon the literature records and the materials collected from 10 localities in Cheju Island. In the present checklist, the total number of species of shrimps and lobsters are 26 species in 12 families, in which *Palaemon (Palaemon) gravieri* and *Pandalus danae* were

unrecorded species from Cheju Island waters. Out of 26 species of shrimps and lobsters which were recorded in this checklist, 11 species in 7 families only appeared in literature records. 26 species occupy 31% of 83 species that were recorded from Korea. 6 species (4%) of 26 species were reported only in Cheju Island, and 9 species (37%) of 24 marine species (excluding 2 freshwater-brackishwater species) were southern form.

REFERENCES

- Bowman, T. E. and L.G. Abele, 1982. Classification of the recent Crustacea. In: The biology of Crustacea, vol. 1, Systematics, the fossil record, and biogeography, edited by L.G. Abele, Academic Press, pp. 1-27.
- Harada, E. and L. B. Holthuis, 1965. Two species of the genus *Ibacus* (Crustacea Decapoda: Reptantia) from Japan. Publ. Seto Mar. Biol. Lab., **13**, 1: 23-34, text-figs. 1-3, pl. 7.
- Kamita, T., 1961. Studies on the fresh-water shrimps, prawns and crawfishes of Japan. Matsue, Japan. 186 pp. figs. 1-71.
- Kim, H. S., 1976a. A checklist of the Macrura (Crustacea, Decapoda) of Korea. Proc. Coll. Natur. Sci., SNU., **1**, 1: 131-152.
- Kim, H. S., 1976b. A new subspecies of *Caridina denticulata* (Crustacea, Decapoda, Atyidae) from Jeju Island, Korea. Korean J. Zool., **19**, 4: 155-160, figs. 1-3.
- Kim, H. S., 1977. Illustrated flora & fauna of Korea, vol. 19, Macrura. Samhwa Publishing Co., 414 pp, text-figs. 1-161, pls. 1-56.
- Kim, H. S., 1985. Systematic studies on crustaceans of Korea, 1. Decapods. Proc. Coll. Natur. Sci., SNU., **10**, 1: 63-94.
- Kim, H. S., 1986. On the geographical distribution of anomuran and brachyuran crabs in Korean waters. Korean J. Syst. Zool., **2**, 2: 67-78.
- Kim, H. S. and C. Y. Chang, 1985. The brachyuran crabs of Cheju Island, Korea (Crustacea: Decapoda). Korea J. Syst. Zool., **1**, 1-2: 41-60, figs. 1-4.
- Kim, H. S. and C. Y. Chang, 1987. The fauna and distribution of mollusks and crustaceans in the estuary of the Nakdong River. Bulletin of the KACN ser. 9: 31-58.
- Kim, H. S. and C. B. Kim, 1987. The anomuran crabs (including thalassinideans) of Cheju Island and its adjacent waters, Korea (Crustacea: Decapoda). Korean J. Syst. Zool., **3**, 2: 225-236, figs. 1, 2.
- Kim, H. S. and I. H. Kim, 1985. Marine invertebrate fauna of Komundo I., Taesambudo I. and Sangpaekdo I. Report on the Survey of Natural Environment in Korea, no. 4: 183-206.
- Kim, H. S. and D. H. Kwon, 1983. Marine invertebrate fauna in the vicinity of Jindo Island. Report on the Survey of Natural Environment in Korea, no. 3. The Islands adjacent to Jindo: 313-336.
- Kim, H. S., K. S. Lee and I.H. Kim, 1979. A faunal and ecological study on the crustaceans in the lower reaches of the Nakdong River where migratory birds come flying. Bull. KACN, **1**: 287-325.
- Kim, H. S. and K. B. Park, 1972. Faunal studies on the macrurans in Korea. In: Floral studies on some taxa of plants and faunal studies on some taxa of animals in Korea. R-72-82, Ministry of Science and Technology, pp. 185-216, pls. 1-6.
- Kim, H. S. and K. B. Park, 1973. Faunal studies on the fresh-water macrurans in Korea. In: Floral studies on the hydroid fungi and sedges and faunal studies on the fresh-water macrurans in Korea. R-73-83, Ministry of Science and Technology, pp. 115-136, figs. 1-4, pl. 1.

- Kim, H. S., B. J. Rho, S. Y. Hong, I. H. Kim, S. Shin and C. H. Han, 1979. The marine invertebrate fauna in the southern part of Geoje Island and its adjacent five islands. Rep. KACN, no. 14: 103-126.
- Yokoya, Y., 1933. On the distribution of decapod crustaceans inhabiting the continental shelf around Japan, chiefly based upon the materials collected by S.S. Sôyômaru, during the year 1923-1930. J. Coll. Agr. Univ., **12**, 1: 1-226, figs. 1-71.

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